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MAT-7941US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	N. Nishiyama et al.	: Art Unit:
Serial No.:	To Be Assigned	: Examiner:
Filed:	Herewith	:
FOR:	A COMPRESSOR USING A MOTOR	:

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231
S I R :

Prior to examination, please amend the above application as follows:

IN THE DRAWINGS:

Please delete page "10/10" of the drawings, also labeled as "Reference Numerals" in its entirety.

Respectfully submitted,

Lawrence E. Ashery, Reg. No. 34,515
Attorney for Applicants

LEA/lm
Dated: April 6, 2000
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Kathleen Libby

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	N. Nishiyama et al.	: Art Unit:
Serial No.:	To Be Assigned	: Examiner:
Filed:	Herewith	:
FOR:	COMPRESSOR USING A MOTOR	:

CONTINUATION APPLICATION OF:

Applicant:	N. Nishiyama et al.	: Art Unit: 2834
Serial No.:	09/543,796	: Examiner: B. Mullins
Filed:	April 6, 2000	:
FOR:	COMPRESSOR USING A MOTOR	:

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231
S I R :

Prior to examination, please amend the above application as follows:

IN THE SPECIFICATION

Specification at page 1, line 3:

This application is a Continuation Application of U.S. Serial No. 09/543,796, filed April 6, 2000 which is a Continuation-In-Part Application of U.S. Serial No. 08/945,460, filed February 2, 1998, which is a U.S. National Phase Application of PCT International Application No. PCT/JP97/00489.

Specification at page 4, line 24:

Moreover, in the core composed by combining plural independent core elements in an annular form, since the winding is turned in

the portion of a slot recess formed at both sides of the teeth of the core element, and the winding is wound about the core element, the winding can be applied on the stator in compact arrangement. Moreover, since the winding is not turned in the adjacent state of teeth, it is not necessary to keep a wide opening between the ends of teeth, so that the interval of ends of teeth can be narrowed.

Specification at page 5, line 6:

Further, in the stator core composed by coupling ends of plural core elements, and folding the core element group with bent ends into an annular form, since the winding is turned in the slot shape recess portion formed at both sides of the teeth of the core elements, when winding around the teeth, the end interval of teeth can be widened, and the winding can be applied around the teeth in compact arrangement. Moreover, since the ends are coupled, position setting when assembling is easy.

Specification at page 9, line 5:

In this way, the stator 2 is formed by combining plural core elements 5. Hence, instead of turning the winding around the stator 2, the stator 2 can be formed after turning the winding around the core element 5. Thus, since the winding is wound about every core element 5, a single winding (concentrated winding) may be formed easily. That is, as shown in Fig. 4, when turning the winding, as shown in Fig. 4, there is no disturbing position for winding at the side surface of the teeth 7. As a result, the winding port of the turning device rotates about the teeth 7, so that an arrangement winding may be formed through an insulating film 24. Moreover, the turning precision of the winding 40 may be enhanced, and the arrangement winding may be formed easily.

Specification at page 11, line 24:

The teeth confronting surface 14a of the permanent magnet 14 is linear. The distance between the teeth confronting surface 14a and the outer circumference of the rotor 13 is wider in the middle part than at the end part of the permanent magnet 14. Thus, in the outer circumference of the rotor 13, having a portion of relatively low reluctance and a portion ofrelatively high reluctance, it is possible to produce an inductance difference between the q-axis inductance and d-axis inductance, so that it is possible to rotate and drive by making use of reluctance torque. Incidentally, the shape of the permanent magnet 14 may be a shape projecting in the middle portion toward the center of the rotor 13.

Specification at page 19, line 10:

Fig. 9 shows a structure of a compressor having a motor of the embodiment of the invention. A compressor comprises a compression mechanism and a motor. The compression mechanism has a function for compressing and discharging are refrigerant. The compressor 1 has an enclosed structure. The compressor 201 is connected to an accumulator 202.

IN THE CLAIMS

1. (Amended) A compressor comprising:

a compressor mechanism, said compressor mechanism compressing and discharging a refrigerant, and

a motor driving said compression mechanism;

a stator core with a plurality of 3n teeth, where n is a natural number, and a concentrated winding applied over each one of said plurality of teeth;

a rotor rotatably mounted in the stator core, said rotor incorporating a plurality of 2n permanent magnets.

2. (Amended) The compressor of claim 1, wherein said rotor further includes an iron material, said iron material being disposed between each of said permanent magnets.

3. (Amended) A compressor of claim 1,

wherein said plurality of permanent magnets is provided at a larger pitch relative to the stator coil pitch.

4. (Amended) The compressor comprising:

a compression mechanism, for compressing and discharging a refrigerant,

a motor driving said compression mechanism, said motor includes a stator core having a plurality of 3n teeth where n is a natural number, a concentrated winding applied over each one of said plurality of teeth and,

a rotor rotatably mounted in the stator core, the rotor incorporating a plurality of 2n permanent magnets, said plurality of permanent magnets are arranged around a rotor center, at least one of said plurality of permanent magnets has a first end and a second end each having respective surfaces facing said stator core and angled toward each other.

5. (Amended) A compressor comprising:

a compression mechanism, for compressing and discharging a refrigerant,

a motor driving said compression mechanism, said motor includes a stator core having a plurality of 3n teeth where n is a natural number, a concentrated winding applied over each one of said plurality of teeth; and a rotor rotatably mounted in the stator core, said rotor incorporating a plurality of 2n permanent magnets,

said plurality of permanent magnets are arranged around a center thereof, and

at least one of said plurality of permanent magnets has a side facing said stator core which is angled inward towards the center.

6. (Amended) A compressor comprising:

a compression mechanism, for compressing and discharging are frigerant, and

a motor driving said compression mechanism, said motor includes a stator core having a plurality of 3n teeth parts where n is a natural number, a concentrated winding applied over each one of said plurality of teeth parts; and

a rotor rotatably mounted in said stator core, said rotor incorporating a plurality of 2n permanent magnets,

a first outer periphery portion of said rotor is different in shape than a second outer periphery portion of said rotor and said second outer periphery portion is positioned in the stator core.

7. (Amended) A compressor of claim 1, further comprising a heat exchanger, wherein

a refrigerating cycle is enabled by the connection of said compressor and said heat exchanger for forming an air-conditioning device.

8. (Amended) The compressor of claim 1, further comprising a heat exchanger, wherein

a refrigerating cycle is enabled by the connection of said compressor and said heat exchanger for forming an air-conditioning device.

9. (Amended) The compressor of claim 1, wherein said plurality of permanent magnets are formed in groups of plural layers, with ends of at least two layers being adjacent to an outer circumference of the stator core.

Please add the following new claims:

10. (Newly Added) The compressor of claim 1, wherein an interval "d" between the ends of each one of the plurality of teeth is smaller than the width of the winding.

11. (Newly Added) The compressor of claim 1, wherein end portions of the adjacent magnets face each other.

12. (Newly Added) The compressor of claim 1, wherein said refrigerant includes HFC (Hydro-Fluoro-Carbon).

13. (Newly Added) The compressor of claim 1, wherein said refrigerant includes a carbon dioxide.

14. (Newly Added) The compressor of claim 1, wherein said refrigerant includes HC (Hydro-Carbon).

Respectfully submitted,

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Attorney for Applicants

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Dated: November 28, 2001
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The Assistant Commissioner for Patents is hereby authorized to charge payment to Deposit Account No. **18-0350** of any fees associated with this communication.

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Kathleen Libby

Kathleen Libby

VERSION WITH MARKINGS SHOWING CHANGES MADE

SPECIFICATION:

Specification at page 1, line 3:

~~This application is a continuation-in-part application of Application Serial No. 08/945,460, filed on February 2, 1998, which is a U.S. National Phase Application of PCT International Application No. PCT/JP97/00489~~This application is a Continuation Application of U.S. Serial No. 09/543,796, filed April 6, 2000 which is a Continuation-In-Part Application of U.S. Serial No. 08/945,460, filed February 2, 1998, which is a U.S. National Phase Application of PCT International Application No. PCT/JP97/00489.

Specification at page 4, line 24:

Moreover, in the core composed by combining plural independent core elements in an annular form, since the winding is turned in the portion of a slot recess formed at both sides of the teeth of the core element, and the winding is ~~turned in a state of~~ wound about the core element, the winding can be applied on the stator in ~~neat~~ compact arrangement. Moreover, since the winding is not turned in the adjacent state of teeth, it is not necessary to keep a wide opening between the ends of teeth, so that the interval of ends of teeth can be narrowed.

Specification at page 5, line 6:

Further, in the stator core composed by coupling ends of plural core elements, and folding the core element group with bent ends into an annular form, since the winding is turned in the slot shape recess portion formed at both sides of the teeth of the core elements, when winding around the teeth, the end interval of teeth can be widened, and the winding can be

applied around the teeth in ~~neat~~ compact arrangement. Moreover, since the ends are coupled, position setting when assembling is easy.

Specification at page 9, line 5:

In this way, the stator 2 is formed by combining plural core elements 5. Hence, instead of turning the winding around the stator 2, the stator 2 can be formed after turning the winding around the core element 5. Thus, ~~by winding in the state of core elements 5,~~ since the winding is ~~turned in~~ wound about every core element 5, a single winding (concentrated winding) may be formed easily. That is, as shown in Fig. 4, when turning the winding, as shown in Fig. 4, there is no disturbing position for winding at the side surface of the teeth 7. As a result, the winding port of the turning device rotates about the teeth 7, so that an arrangement winding may be formed through an insulating film 24. Moreover, the turning precision of the winding 40 may be enhanced, and the arrangement winding may be formed easily.

Specification at page 11, line 24:

The teeth confronting surface 14a of the permanent magnet 14 is linear. The distance between the teeth confronting surface 14a and the outer circumference of the rotor 13 is wider in the middle part than at the end part of the permanent magnet 14. Thus, in the outer circumference of the rotor 13, having ~~the easily passing~~ a portion of relatively low reluctance and ~~hardly passing~~ a portion of ~~magnetic flux~~relatively high reluctance, it is possible to produce an inductance difference between the q-axis inductance and d-axis inductance, so that it is possible to rotate and drive by making use of reluctance torque. Incidentally, the shape of the permanent magnet 14 may be a shape projecting in the middle portion toward the center of the rotor 13.

Specification at page 19, line 10:

Fig. 9 shows a structure of a compressor having a motor of the embodiment of the invention. A compressor comprises a compression

mechanism and a motor. The compression mechanism has a function for compressing and ~~vomiting~~ discharging a ~~refrigerator~~ refrigerant. The compressor 1 has an enclosed structure. The compressor 201 is connected to an accumulator 202.

CLAIMS:

1. (Amended) A compressor comprising:

a compressor mechanism, said compressor mechanism ~~having a function for~~ compressing and ~~vomiting~~ discharging a ~~refrigerator~~ refrigerant, and

a motor driving said compression mechanism;

~~wherein said motor includes~~ a stator core ~~having~~ with a plurality of 3n teeth ~~parts~~, where n is a natural number, and a concentrated winding applied over each ~~teeth part~~ one of said plurality of teeth ~~parts and a rotor incorporating a plurality of permanent magnets~~;

~~said stator core is formed in an annular form by combining said plurality of core elements, and~~

~~each of said plurality of permanent magnets is provided at a larger pitch than the stator coil pitch~~a rotor rotatably mounted in the stator core, said rotor incorporating a plurality of 2n permanent magnets.

2. (Amended) The compressor of claim 1, wherein said rotor further includes an iron material, ~~as a flux of magnetic induction,~~ said iron material being disposed between ~~said~~ each of said permanent magnets.

3. (Amended) A compressor of claim 1, ~~comprising:~~

~~a compression mechanism, said compressor mechanism having a function for compressing and vomiting a refrigerator, and~~

~~a motor driving said compression mechanism,~~

~~wherein said motor includes a stator core having a plurality of teeth parts, a concentrated winding applied over each teeth part of said plurality of teeth parts and a rotor incorporating a plurality of permanent magnets,~~

~~said stator core is formed in an annular form by combining said plurality of core elements, and~~

~~each of~~ wherein said plurality of permanent magnets is provided at a larger pitch relative to ~~than~~ the stator coil pitch.

4. (Amended) The compressor comprising: ~~of claim 3 wherein said each teeth part includes an outer circumference part, and said each teeth part is combined by fitting parts disposed at end portion of said outer circumference part.~~

a compression mechanism, for compressing and discharging a refrigerant,

a motor driving said compression mechanism, said motor includes a stator core having a plurality of 3n teeth where n is a natural number, a concentrated winding applied over each one of said plurality of teeth and,

a rotor rotatably mounted in the stator core, the rotor incorporating a plurality of 2n permanent magnets, said plurality of permanent magnets are arranged around a rotor center, at least one of said plurality of permanent magnets has a first end and a second end each having respective surfaces facing said stator core and angled toward each other.

5. (Amended) A compressor comprising:

a compression mechanism, ~~said compressor mechanism having a function~~ for compressing and ~~vomiting~~ discharging ~~a refrigerator~~ refrigerant, ~~and~~

a motor driving said compression mechanism, said motor includes a stator core having a plurality of 3n teeth where n is a natural number, a concentrated winding applied over each one of said plurality of teeth; and a rotor rotatably mounted in the stator core, said rotor incorporating a plurality of 2n permanent magnets,

~~wherein said motor includes a stator core having a plurality of teeth parts, a concentrated winding applied over each teeth part of said plurality of teeth parts and a rotor incorporating a plurality of permanent magnets,~~

~~each of said plurality of permanent magnets is provided at a larger pitch than the stator coil pitch,~~

said plurality of permanent magnets are arranged around a center thereof, and

at least one of said plurality of permanent magnets has a ~~magnet forward portion and a magnet backward portion each having respective~~

~~surfaces~~ side facing said stator core ~~and~~ which is angled inward towards ~~each other~~the center.

6. (Amended) A compressor comprising:

a compression mechanism, ~~said compressor mechanism having a function~~ for compressing and ~~vomiting~~discharging ~~a refrigerator~~ refrigerant, and

a motor driving said compression mechanism, said motor includes a stator core having a plurality of 3n teeth parts where n is a natural number, a concentrated winding applied over each one of said plurality of teeth parts; and

~~wherein said motor includes a stator core having a plurality of teeth parts, a concentrated winding applied over each teeth part of said plurality of teeth parts and~~ a rotor rotatably mounted in said stator core, said rotor incorporating a plurality of 2n permanent magnets,

~~each of said plurality of permanent magnets is provided at a larger pitch than the stator coil pitch,~~

~~said plurality of permanent magnet are arranged around a center thereof, and~~

~~at least one of said plurality of permanent magnets has a side facing said stator core which is indented inward towards the center.~~ a first outer periphery portion of said rotor is different in shape than a second outer periphery portion of said rotor and said second outer periphery portion is positioned in the stator core.

7. (Amended) A compressor ~~comprising:~~ of claim 1, further comprising a heat exchanger, wherein

~~a compression mechanism, said compressor mechanism having a function for compressing and vomiting a refrigerator, and~~

~~a motor driving said compression mechanism,~~

~~wherein said motor includes a stator core having a plurality of teeth parts, a concentrated winding applied over each teeth part of said plurality of teeth parts and a rotor incorporating a plurality of permanent magnets,~~

~~each of said plurality of permanent magnets is provided at a larger pitch than the stator coil pitch, and~~

~~a first outer periphery portion of said rotor is different shape than a second outer periphery portion of said rotor without said second outer periphery portion being situated directly between any of said magnet.~~ a refrigerating cycle is enabled by the connection of said compressor and said heat exchanger for forming an air-conditioning device.

8. (Amended) ~~An air-conditioner~~ The compressor of claim 1, further comprising a heat exchanger, wherein:

~~a compressor of claim 1,~~

~~a heat exchanger, and~~

a refrigerating cycle is enabled by the ~~connecting~~ connection of said compressor and said heat exchanger for forming an air-conditioning device.

9. (Amended) ~~A refrigerator comprising:~~The compressor of claim 1, wherein said plurality of permanent magnets are formed in groups of plural layers, with ends of at least two layers being adjacent to an outer circumference of the stator core.

~~a compressor of claim 1,~~

~~a heat exchanger, and~~

~~a refrigerating cycle connecting said compressor and said heat exchanger.~~

Claims 10-14 have been added.